

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON.

DESCRIPTIONS OF NEW PLANTS FROM SOUTHERN
CALIFORNIA, NEVADA, UTAH, AND ARIZONA.

BY FREDERICK VERNON COVILLE.*

In January, 1891, an expedition was sent out by the United States Department of Agriculture to make a biological survey of Death Valley, in southeastern California, and the adjacent regions. As several months must elapse before the report on the botany of the expedition can be presented to the public, the following descriptions of new plants are now published with the consent of the department authorities.

***Aplopappus interior* sp. nov.**

Related to *A. linearifolius* DC., but differing in its shorter leaves (12 to 20 mm.), subulate-bracteate peduncles, shorter acute involucre bracts, and smaller rays 9 to 11 mm. long. In *A. linearifolius* the larger leaves are 30 to 40 mm. long, the peduncles leafy-bracted, the involucre bracts 11 to 14 mm. long, including the filiform-subulate acumination, and the rays 13 to 15 mm. long.

Type specimen in the United States National Herbarium, No. 794, Death Valley Expedition; collected May 20, 1891, about four miles southeast from Mill Cañon divide, at the northern

* Presented at a meeting of the Biological Society of Washington, April 16, 1892.

edge of the Darwin Mesa, Inyo County, California, by Frederick V. Coville.

A. linearifolius. first collected in California by Douglas, probably near San Francisco or Monterey, is known only from the coast ranges southward from San Francisco bay. *A. interior* is a species of the desert mountains, and has been collected in the higher elevations of the Lower Sonoran region from southern Utah, northwestern Arizona, and Inyo County, California, southward to the extra-coastal region of San Diego County.

***Arctomecon merriami* sp. nov.**

Plant apparently perennial, from a thick woody root, branching into a broad cæspitose tuft 10 cm. or less high; leaves cuneate-oblongate, 2 to 3 cm. long, tapering below into a margined petiole, tridentate at the truncate apex, glaucous, clothed with very long (about 1 cm.), white, spreading, flexuous, barbellate hairs; upper leaves sessile, often entire and acute or obtuse at the apex; peduncles several, erect, 20 to 35 cm. high, glabrous, glaucous, rarely with a bract (similar to the leaves) below; flower single, in bud inclined to nod; sepals usually 3, hairy like the leaves, caducous; petals usually 6, white, obovate, 3 to 3.5 cm. long, deciduous; stamens very numerous; anthers 3 to 4 mm. long when wet; filaments slender, glabrous, some of them conspicuously broader above; ovary narrowly oblong, 1-celled, with 6 or 7 parietal placentæ; style about 1.5 mm. long and broad; stigma capitate and with a stigmatic line opposite each placenta; capsule linear-oblong, in our specimens 3.5 to 4.1 cm. long; valves splitting down at the apex for a distance of 8 mm.; seeds not seen.

Type specimen in the United States National Herbarium, No. 1890, Death Valley Expedition; collected May 1, 1891, a few miles west of Vegas ranch, Lincoln County, Nevada, by C. Hart Merriam and Vernon Bailey.

This plant differs from *A. californicum* in its usually 1-flowered bractless peduncles, long-hairy sepals, white petals, longer dilated filaments, linear-oblong ovary and capsule (4 cm. long), and evident style. *A. californicum* has, on the other hand, 6- to 20-flowered, leafy-bracted peduncles, glabrous sepals; deep yellow petals, filaments of uniform width, obovoid ovary, sessile stigma, and an ovate capsule about 1.5 cm. long.

This beautiful poppy is dedicated to Dr. C. Hart Merriam as a token of his influence in the progress of geographic botany.

Arctomecon humile sp. nov.

In 1874 Dr. C. C. Parry collected in the vicinity of St. George, Utah, an *Arctomecon*, which Dr. Gray referred* to *A. californicum*. The material now in hand shows that it is distinct both from the original plant of Fremont and from the species just described. It differs from the former in its smaller size throughout, less hairy leaves, fewer flower parts, white petals, dilated filaments, and the presence of a style; from *A. merriami* in its smaller size and more scanty hairs, more than 1-flowered peduncles, fewer flower parts, persistent petals, and obovate, several times shorter capsule.

Type specimen in the Harvard Herbarium.

The genera *Canbya* and *Arctomecon* are described† as distinguishable by their stigmas; in the former opposite the placentæ, in the latter opposite the valves. In *Arctomecon merriami* the capitate stigma is evidently made up of as many parts or lobes as there are placentæ, and each of these parts is directly opposite a valve. Along both lateral margins of each lobe are stigmatic lines, and the union of the two contiguous ones, of adjacent lobes, makes a stigmatic line opposite the placenta. There is nothing in *Canbya* to show that the stigmatic line, which is there also opposite the placenta, was not derived in the same way; yet the two genera are sufficiently characterized by their general differences.

Arenaria compacta sp. nov.

Stems compacted into a dense mat from a thick, woody, many-branched caudex, the densely leafy lower portion 1 cm. or less high; flowering stems scantily leafy, sparingly cymosely branched, 5 cm. or less high, clothed with short glandular hairs; leaves awl-shaped, triangular in cross-section, pungent, glandular-ciliate, 5 mm. or less long, squarrose; those of the flowering stems similar, usually glandular-hairy on the back, erect, passing into scarious bracts above; flowers single, terminating simple stems, or in open few-flowered cymes; sepals 5, 2.5 to 3.5 mm. long, ovate to ovate-lanceolate, scarious-margined, with a thick green midrib excurrent into a point; petals 5 or 6, oblong-oblancheolate, broadly obtuse; stamens 10 to 12; styles 3 or 4.

* Proc. Amer. Acad. Sci., XII, 1877, 53, pl. II.

† Idem, XII, 1877, 52, and XXII, 1887, 270.

Type specimen in the United States National Herbarium, No. 1653, Death Valley Expedition; collected August 20, 1891, at timber-line on a divide northwest of Whitney Meadows, Sierra Nevada, Tulare County, California, by Frederick V. Coville.

The plant is of especial interest because it is evidently a local alpine species derived not from the circumpolar *Arenaria biflora* and *A. arctica*, but from some local species of a lower zone, similar to *A. fendleri*. Its sepals distinguish it at once from the circumpolar plants mentioned above, in which these organs are thin, striate, and obtuse. In habit, however, it closely resembles them, having attained the depressed, matted, shrubby form so protective to plants at high altitudes.

Brickellia desertorum sp. nov.

Shrubby, about 1 m. high; branches minutely white-tomentose, becoming glabrous in the second or third year, but still with a white epidermis, afterward gray; leaves alternate, minutely cinereous-tomentose; petioles 2 to 5 mm. long; blades deltoid ovate, truncate at the base, crenate-dentate, commonly 3 to 8 mm. long, on vigorous shoots reaching 16 mm. in length; heads in glomerules of 2 to 4 flowers, on short leafy branches from a main axis, or in the second or third year the branches elongated and divaricate and bearing a single terminal glomerule; involucre 7 to 8 mm. high, about 10- to 12-flowered; bracts 3-nerved, with traces of minute tomentum, 1 mm. or less wide, bluntly acute, the outermost oblong-lanceolate, all widely recurved after the maturing of the achenia; achenia 2 mm. long, sparingly short hispid; pappus scabrous.

This plant differs from *B. californica* in its more shrubby branches, whiter stems, much smaller canescent leaves, and heads smaller throughout. In *B. californica* the involucre are commonly 10 to 12 mm. long and the bracts obtuse, while the achenia are 3 mm. long.

Type specimen in the United States National Herbarium; collected November 7, 1889, between Banning and Seven Palms, on the Southern Pacific Railroad, California, by C. R. Orcutt.

The type specimen of *B. californica* was collected by Douglas probably near San Francisco or Monterey. That species is known in the coast region of California from Mendocino county as far south at least as San Diego. Specimens from Utah and Arizona

have been referred to *B. californica* only with doubt. The new species is known only from the Colorado and Mohave Desert regions. It shows close relationship, too, with the type form of *B. reniformis*, but differs from it, as from *B. californica*, in canescence and size of leaves, heads, and achenia.

***Buddleia utahensis* sp. nov.**

Shrub 20 to 30 cm. high, young branches leaves and calyces densely tomentose; leaves linear to narrowly linear-oblong, irregularly crenate, with undulate revolute margins, conspicuously venose-reticulate, 1.5 to 2 cm. long, reflexed or divaricate on petioles 1 to 2 mm. long, with smaller leaves axillary-fasciculate; inflorescence made up of 2 to 4 distinct spheroidal congested clusters (about 1.5 cm. in diameter and about the same distance apart) of flowers spicately arranged at the extremities of the branches; bracts subtending the clusters similar to the leaves, the uppermost much smaller; calyx lobes 1-nerved; corolla in dried specimens brownish purple, weathering to straw color, tube tomentose without, lobes widely spreading; anthers sessile in the throat of the corolla.

This plant is closely related to *B. marrubiiifolia*, but is readily distinguished by its spicate flower clusters and narrow leaves. In that species the single spherical head terminates the branches upon a well defined peduncle, while the leaves vary from ovate to obovate with cuneate base.

Type specimen in the United States National Herbarium; collected in 1877 near St. George, southern Utah, by Edward Palmer.

The plant has been collected but twice, once in the type locality and now at the foot of a limestone cliff just north of Mountain Spring, near Olcott Peak, Charleston Mountains, Nevada. The former is the most northerly locality known for any species of the genus. *B. marrubiiifolia* is known in the United States only in southern Texas.

***Erigeron calva* sp. nov.**

Apparently biennial, widely branching from the base, 1 cm. high, sparingly canescent with hirsute pubescence; radical leaves very numerous, blade oblong to obovate, 1 to 1.5 cm. long, tapering into a petiole of twice that length; upper leaves spatulate, becoming much smaller; heads singly pedunculate

on the branches, 7 to 8 mm. high, hemispherical, with very many flowers; involueral bracts narrowly linear, acuminate, hirsute; ray flowers numerous, but with rays minute, pink, and shorter than the disk; pappus of ray and disk flowers alike, consisting of several long, stout, closely barbellate bristles (4 mm. long), equalling the disk corollas, and a few intermediate much shorter ones; achenium compressed, short villous.

This species resembles in general appearance no described *Erigeron*. Its heads closely resemble those of *E. supplex*, but that species has no ray flowers whatever. Its pubescence is similar to that of *E. concinnus*. The specific name refers to the bald appearance of the heads, due to the minuteness of the rays.

Type specimen in the United States National Herbarium, No. 870, Death Valley Expedition; collected May 16, 1891, at the foot of the Inyo Mountains, about four miles north of Keeler, California, by Frederick V. Coville.

***Erysimum asperum perenne* Watson, var. nov.**

Apparently perennial, the old stem-base horizontal or nearly so; stem erect, 25 to 50 cm. high; radical leaves oblong to oblanceolate, entire or very sparsely denticulate-dentate, tapering into a long petiole, sparsely strigose (like the stem) with the pick-shaped hairs of *E. asperum*; stem leaves narrowly oblanceolate; petals light yellow; fruit wanting.

Type specimen in the United States National Herbarium, No. 1487, Death Valley Expedition; collected August 5, 1891, between Mineral King and Farewell Gap, Sierra Nevada, Tulare County, California, by Frederick V. Coville.

Dr. Watson, in answer to my letter (forwarded to him with the specimens) saying that this plant appeared distinct from *E. asperum* and similar to *E. pumilum* of Nuttall, determined the plant questionably as a new variety of *E. asperum*, and sent the following note: "This may be distinct, but it is impossible to define a new species from this material. It has not the habit of '*E. pumilum*,' which is a very dubious species. Its perennial character, as your specimens show, is not always obvious, and our other high mountain specimens from California and elsewhere do not help to distinguish it from *E. asperum*." The plant differs conspicuously from the ordinary Californian form of *E. asperum* in its yellow instead of orange petals, perennial rootstock, smaller size, less canescent herbage, and broader root-leaves, and, furthermore,

in its geographic range at a uniformly higher altitude, above the belt of *Pinus jeffreyi*, to which, with that of *Pinus ponderosa*, the former appears to be confined.

***Frasera tubulosa* sp. nov.**

Plant a biennial or short-lived perennial, in our specimens about 60 cm. high; stem stout, terete, glabrous, glaucous, about 6 mm. thick at the base; radical leaves in a dense rosette, linear-oblancoelate, obtuse, mucronate, reaching 1 cm. in width and 9 cm. in length, usually conduplicate and the apex recurved, thick, minutely scabro-puberulent, glaucous in appearance, its margin white, cartilaginous, entire; stem leaves similar, becoming smaller above, in whorls of 5 or 6; inflorescence a narrow spicate panicle 30 to 40 cm. long, interrupted below, its branches reaching 5 cm. in length, mostly shorter, erect; pedicels 2 to 20 mm. long, erect; sepals 4, linear-subulate, 6 to 8 mm. long, often spinulose-denticulate toward the base; petals 4, white, oblong-obovate, acuminate, 9 to 11 mm. long, slightly gibbous at the base; gland on the face of the petal none, but represented by a tube of the same texture, and half as long, as the corolla, inserted over the gibbosity at the base of the petal, split about half way to the base in a direction tangential to the axis of the flower, the posterior lobe slightly larger and both lacerate-fimbriate; stamens 4, filaments about as long as the sepals, anthers oval, 2 mm. long; ovary compressed, oblong-lanceolate, tapering into 2 subulate appressed styles, the whole equalling the stamens; placenta at the edges of the ovary, not intruded; ovules 6 to 10, oblong, very thin and flat; stigmas recurved-spreading, flat, hardly broader than the style; capsule very flat; valves obovate-oblong, with callous thickened margins and 1 median nerve continued into the stiff subulate persistent style, the whole 12 to 14 mm. long; seed single, lamelliform, oblong, minutely cellular-muriculate, about 5 to 7 mm. long.

This plant differs from all other species of the genus in the apparent absence of the petaline gland and in the presence of the tubular nectary described above. The leaves are very similar to those of *F. albomarginata*, while the form of the inflorescence resembles that of *F. nitida* and *F. albicaulis*.

Type specimen in the United States National Herbarium, No. 1598, Death Valley Expedition; collected August 17, 1891, in

dry soil under *Pinus jeffreyi* in the northeast corner of the enclosure at Soda Springs, on the north fork of Kern River, Sierra Nevada, Tulare County, California.

***Gilia setosissima punctata* var. nov.**

Flowers and fruit larger than in the type form; corolla with tube about 10 mm. long, its lobes 7 to 10 mm. long, white, with purple dots sometimes arranged in longitudinal lines, and a pair of golden spots at about the middle; capsule 6 to 9 mm. long, often with 10 seeds in each of the 3 cells.

The plant differs from the type form in the characters above mentioned. In *G. setosissima* the corolla tube has about the same length, but the lobes are much smaller (3 to 5 mm. long) and cream-colored, with neither purple nor yellow markings, and the capsule is commonly about 5 mm. long with about 5 seeds in a cell. This variety holds the same relation to the type form that *G. matthewsii* does to *G. schottii*, except that in the case of the latter two species the differentiation appears to be complete, while in the former integrades in size and coloration occur. The flowers of *G. setosissima* and its variety are regular, erect, and with straight stamens, while those of the other two species are irregular, inserted at an angle or even horizontally, and have ascending stamens. In herbarium specimens this irregularity is often obscured, and *G. schottii* is frequently confounded with *G. setosissima*. Both *G. schottii* and *G. matthewsii* are, however, readily distinguishable from *G. setosissima* and its variety by a vegetative-character which was originally pointed out* by Watson, but which was afterward lost sight of. In the former the lateral bristles of the leaf arise singly, in the latter in twos (rarely singly or in threes), from each hair tubercle. This character is constant.

These four plants are very interesting from the standpoint of their genealogical interrelation. The parent form probably was, or was very similar to, *G. setosissima*; from this *G. schottii* developed; and then, from both these, plants with larger, strikingly colored corollas differentiated, *G. setosissima punctata* and *G. matthewsii* respectively. The name adopted for the variety is one used on herbarium specimens by Dr. Gray but never published.

Type specimen in the United States National Herbarium, No. 716, Death Valley Expedition; collected April 21, 1891, in Sur-

* Bot. King Surv., 1871, 267.

prise Cañon, Panamint Mountains, California, by Frederick V. Coville.

***Isomeris arborea globosa* var. nov.**

Stem not glaucous; petals ovate, sub-palmately veined; capsule globose, truncate or retuse, 2.5 to 3.5 cm. long; seed with a transverse groove between hilum and body; otherwise as the type form.

Our plant differs conspicuously from the type form in the shape of its capsules, a character at once noticeable in the living plant. The stems of the new year's growth in the type form are glaucous; the petals narrowly oblong and pinnately veined; the capsules oblong, attenuate into the stipe, abruptly tapering at the apex; and the seeds without a groove between the hilum and the body. The same plant as ours, but without mature fruit, was collected by Xantus de Vesey near Fort Tejon in 1857-58.

Type specimen in the United States National Herbarium, No. 1107, Death Valley Expedition; collected June 24, 1891, on Caliente Creek, a few miles above Caliente, Kern County, California, by Frederick V. Coville.

The characteristic distribution of this variety was not ascertained. It might be expected to be a form modified by proximity to the Mohave Desert, but the type form enters the western portion of this desert in at least one place, Tehachapi Pass; and flowering specimens, presumably of the type form, were seen in April about forty miles from Mohave on the road from that place to Scarles' borax establishment.

***Lepidospartum striatum* sp. nov.**

Shrub 1 to 1.6 m. high, with a stout erect trunk; branches numerous, erect, striate-angled by 3 ribs decurrent from each leaf-base, closely white-tomentose, the ribs resiniferous and glabrous; leaves alternate, filiform-linear, thicker above, acute, slightly spreading, 20 to 25 mm. long, or the upper only 10 mm.; heads 2 to 5 at the apex of the branch, singly sessile, or very short-peduncled, in the axils of leaf-like bracts, 12 to 16 mm. long; involucre oblong to narrowly oblong, 7 to 10 mm. high; bracts about 9, broadly ovate to narrowly oblong, obtuse, stiff, coriaceous, with narrow membranaceous margin, lanate on the back, imbricated, the outer successively shorter; flowers 5; corolla

lobes linear-lanceolate, acute, longer than the throat, with marginal nerves and an oblong or linear resin duct at the apex; anthers acutely sagittate at the base; anther-tips obtuse; styles 2 to 2.5 mm. long, linear, bluntly acute but short-hairy so as to appear obtuse; achenium densely villous with spreading long white hairs; pappus copious, white, of conspicuously scabrous soft bristles.

This plant has the general appearance of a *Tetradymia*, but the involucre and style-tips of *Lepidospartum*. The branches resemble those of *T. glabrata*, except that the decurrent leaf-base is made up of three slender ribs instead of one broad line. The leaves too are very similar to the primary ones of that species. The involucral bracts are thoroughly imbricated, and in this respect are quite different from those of any *Tetradymia*; yet their texture and pubescence are the same. The pappus and achenia closely resemble those of *T. glabrata* and *T. canescens incermis*. The median nerve of the corolla lobes in *Tetradymia* and in *Lepidospartum squamatum*, which are really resin ducts, are here reduced to large linear or oblong apical resin glands not produced to the base of the lobe. The anther tip is really acute but from the hairs about it appears obtuse, and somewhat resembles that of *Tetradymia*. The plant forcibly suggests the reuniting of *Lepidospartum* with *Tetradymia*, as a subgenus, a position in which Dr. Gray* once placed it, but the involucre of the two genera are of quite different types.

Type specimen in the United States National Herbarium, No. 558, Shockley, 1888; collected in August, 1888, in Soda Springs Cañon, Esmeralda County, Nevada, by W. H. Shockley.

***Mentzelia reflexa* sp. nov.**

Plant annual, 20 cm. or less high; stem stout, diffusely branching from the base, brownish white and striate when dry, hirsute, as well as the leaves and calyx lobes, with retrose barbed, as well as with upwardly denticulate, hairs; leaves from linear-ob-lanceolate below to ovate or even hastate above, short-petioled or sessile, all irregularly sinuate-dentate or the lowest almost pinnatifid; flowers single on short usually 1- or 2-leaved axes in the forks of the stem; ovary broadly oblong, 4 to 5 mm. long,

* Proc. Amer. Acad. Sci., IX, 1874, 207.

hirsute; calyx lobes triangular-subulate, about 1.5 mm. broad at base by 5 to 6 mm. long; petals oblong-ob lanceolate, tapering to a bluntly acute apex, equalling the calyx lobes; staminodia none; stamens 9 to 13, shorter than the calyx; filaments expanded at base only, or almost to the apex, to a width of about .5 mm.; anthers small, about as broad as long; placentæ 3, broad, fleshy; ovules about one-half imbedded in the placentæ; style cleft for about one-third its length, equalling the stamens; capsule oblong, 8 to 10 mm. long, its pedicel reflexed at the apex; seeds about 10 or 12 in each capsule, gray, somewhat compressed, angularly obovate or pyriform, slightly constricted below the middle, and with a deep transverse groove on either face along this line, muriculate throughout.

This plant appears not to be closely related to any known species of *Mentzelia*. It resembles in its petals, stamens, and seeds *M. torreyi*, and in the last of these organs *M. tricuspis* and its allies. Its characteristic external features are its diffusely branched but stiff habit, its flowers scattered in the forks of the stem, and its reflexed fruiting pedicels. Its seeds resemble those of *M. tricuspis*.

Type specimen in the United States National Herbarium, No. 709, Death Valley Expedition; collected April 21, 1891, in Surprise Cañon, Panamint Mountains, California, by Frederick V. Coville and Frederick Funston.

***Phacelia perityloides* sp. nov.**

Suffrutescent perennial 10 to 20 cm. high, diffusely branched, densely leafy; stem, as well as branches, leaves, and calyx, viscid with glandular hairs, or at the base densely villous-tomentose; leaves alternate; petiole 7 to 15 mm. long; blade orbicular with truncate to cordate base, crenate-dentate or even lobed, 7 to 12 mm. in diameter, the hairs shorter than on the stem and petiole; flowers in loose racemes terminating the branches; pedicels 3 to 5 mm. long; calyx about 4 mm. long, the lobes oblong-spatulate, obtuse; corolla cream-white, sparingly glandular-hairy, twice as long as the calyx, its narrowly campanulate tube longer than the calyx and its short orbicular lobes abruptly spreading; appendages 10 semilanceolate vertical lamellæ free from the filaments; the 3 veins of each corolla lobe continuing distinct to the base of the tube; stamens included

in the throat of the corolla; anthers oblong; ovary and included style sparingly short hairy; style tips very short, divergent; capsule narrowly ovate, bluntly acute, 3 to 4 mm. long; seeds apparently very numerous, oblong, angulate by compression, serobiculate, 5 mm. long.

The plant closely resembles a small congested specimen of *Perityle emoryi*. The form of the leaves is very similar to that in *P. rotundifolia*, but the plant, while belonging to the subgenus *Eutoca*, differs from all its species in being suffrutescently perennial. The cream-white corollas form another conspicuous character.

Type specimen in the United States National Herbarium, No. 524, Death Valley Expedition; collected March 31, 1891, in Johnson Cañon, Panamint Mountains, California, by Frederick V. Coville.

***Potentilla eremica* sp. nov.**

Plant of the sub-genus *Ivesia*, perennial, in large tufts from a branched caudex, villous-canescens throughout; stems few, erect or procumbent, 10 to 20 cm. high, sparingly short-leaved; radical leaves many, the largest 13 cm. long, terete; leaflets sometimes 60 pairs, entire, broadly ovate, acute or obtuse, 2 to 2.5 mm. wide, closely imbricated in 2 rows along the rachis; stem leaves similar; shorter, borne at intervals of about 1 to 2 cm., the uppermost not exceeding 1 cm. in length; cyme narrow, about 5 cm. long; bracts simple or few-cleft, about 3 mm. long; pedicels 5 to 7 mm. long, erect; calyx 3 to 4 mm. long, lobes lanceolate-acuminate; calyx bracts ovate; stamens 20; pistils apparently 2 or 3; hairs of the receptacle dense, conspicuous, 1 to 1.2 mm. long.

This plant was collected in winter, so that only the remains of the inflorescence of the preceding year were found. The leaves at first sight closely resemble those of *P. santolinoides*. The plant was found in but one place, about two miles east of Watkins' ranch (and about one-half mile south of the "devil's hole"), in an alkaline limestone marsh on a sloping gravelly mesa, growing with *Spartina gracilis*, *Anemopsis californica*, and *Schaenus nigricans*.

Type specimen in the United States National Herbarium, No. 366, Death Valley Expedition; collected March 2, 1891, near Watkins' ranch, Ash Meadows, Nye County, Nevada.

Potentilla purpurascens pinetorum var. nov.

Plant caespitose from a many-branched caudex; stems about 3 cm. high; inflorescence loosely cymose; radical leaves very numerous, 7 to 14 cm. long; lower leaflets about 7 mm. long, 2-divided, the divisions often 2-lobed; upper leaflets merely 2-lobed; divisions in both oblong-oblancheolate, glabrous or very scantily villous; otherwise as the type form.

In aspect our plant is quite different from Rothrock's specimens of the type form,* they being but 5 to 16 cm. high, with shorter leaves, and shorter, broader, more congested, villous-hirsute leaflets. The characters of the flowers are identical. The following references to *Potentilla purpurascens* may be helpful: Wats. Proc. Amer. Acad. XI 148 (1876) under *Horkelia*; Greene, Pittonia I 105 (1887).

Type specimen in the United States National Herbarium, No. 1579, Death Valley Expedition; collected August 10, 1891, at Trout Meadow, Sierra Nevada, Tulare County, California, by Frederick V. Coville.

Our plant was abundant throughout the valley of the north fork of Kern River, in forests of *Pinus jeffreyi*, along the rather dry margins of meadows. Rothrock's came from a higher altitude, 9,000 feet, "on the head-waters of Kern River," and is undoubtedly a derivative form modified by changed conditions.

Sarcobatus baileyi sp. nov.

Shrub .5 to 1 m. high; bark dark gray after the first year; branches divaricate, closely interlocking, the ultimate branchlets always spinescent; leaves 8 to 14 mm. long or shorter, pubescent, especially near the apex, with short, flattened, branched, reflexed hairs, the later leaves often glabrate in age; male spike not seen; fertile spikes infra-axillary on old wood, consisting of 2 female flowers at the base (one often wanting), each in the axil of a leaf, and a terminal spiciform portion of male flowers, the whole axis 1 to 1.5 cm. long; fruit very large: body 8 to 9 mm. long, about 5 mm. broad at its widest point; wing oblong-orbicular, erose, 10 to 15 mm. by 8 to 10 mm. in diameter; seed not developed.

The plant differs from *S. vermiculatus* in its smaller size, always spinescent branchlets, intricate and compact growth, smaller and

* Bot. Wheeler Surv., 1876, pl. III.

usually pubescent leaves, larger fruit, and different inflorescence. *S. vermiculatus* usually grows, in Nevada, 1.2 to 1.8 m. high, with branches less intricate and often not spine-tipped, and leaves when well developed 12 to 20 or even 30 mm. long and almost invariably glabrous. Its fertile flowers are described by Bentham and Hooker* as axillary and solitary, but the axis on which they are borne is really continued into a rudimentary male spikelet similar to that of *S. baileyi*, but each floral axis, instead of bearing 1 or 2 female flowers as in that species, commonly has from 4 to 8. In *S. vermiculatus* the body of the fruit is 4 to 5 mm. long, 2.5 to 3.5 mm. broad, and the wing 7 to 13 mm. by 5 to 8 mm. in diameter.

Type specimen in the United States National Herbarium, No. 1994, Death Valley Expedition; collected June 2, 1891, in a valley near Thorpe's quartz-mill, Nye County, Nevada, by Vernon Bailey.

The plant was first seen by Mr. Bailey at Cloverdale, Esmeralda County, Nevada, in 1890, and recognized by him as different from *S. vermiculatus*. In company with Dr. Merriam he afterward found it in a valley in Nye County, Nevada, southeast by east from Gold Mountain, near Thorpe's quartz-mill, and later in Fish Lake Valley westward from the other localities, on the California state line. There is in the National Herbarium a specimen of the same plant collected by J. G. Lemmon in 1875, probably in western Nevada. The species is therefore confined, so far as known, to the counties of Esmeralda and Nye, in Nevada, and Mono and Inyo, in California. I take pleasure in associating Mr. Bailey's name with this shrub, both as a mark of his earnest and invaluable labors in the field of natural history and as a reminder of a warm friendship established among the vicissitudes of a desert exploration.

***Saxifraga integrifolia sierræ* var. nov.**

Blades of larger leaves 8 to 12 cm. long, oblong-lanceolate to elliptical-lanceolate, acute, conspicuously serrate-denticulate, from glabrous to sparingly clammy-hairy above and beneath, thinner and more distinctly veined than in the type; petiole and margin of the leaf toward the base ciliate with clammy hairs; otherwise as the type form.

* Gen. Pl. III, 1880, 76.

Type specimen in the United States National Herbarium, No. 1705, Death Valley Expedition; collected August 25, 1891, about eight miles northwest of Whitney Meadows, on the headwaters of Kern River, Sierra Nevada, Tulare County, California, by Frederick V. Coville.

The species was described* from specimens collected by Scouler "near the mouth of the Columbia, northwest coast of America," and is excellently figured.† Specimens collected in later years in the same region agree with Hooker's description and figure in being viscid-pubescent throughout, and in having the leaves oblong, entire, obtuse, and scarcely exceeding 3.5 cm. in length. None of the specimens from the Sierra Nevada resemble the type form, but a good series of intergrades exist between the two regions and in the Rocky Mountains where the variety occurs also.‡ The Sierran plant appears never to have been described except in the Botany of California, where the description of the type form is varied to include it. In Dr. Gray's conspectus of the species of *Saxifraga* § it is not distinguished from Hooker's plant.

***Stylocline arizonica* sp. nov.**

Plant of the subgenus *Eustylocline*, 5 cm. or less high; habit that of *S. micropoides*; leaves obtuse or abruptly acute; heads 4.5 to 6 mm. high; bracts of the receptacle broadly winged around the conduplicate portion; achenium lunate.

The species differs from *S. micropoides* in its prevailing obtuse leaves, its winged bracts, and its lunate achenia; that species having narrowly acute leaves, bracts not produced into wings at the margin, and straight achenia. From *S. gnaphaloides* it differs in its smaller size, larger heads, and linear-oblong leaves. *S. gnaphaloides* attains a height of 8 to 10 cm. and is very diffusely branched, while its heads are seldom more than 3 mm. high and its leaves are oblanceolate with a tapering base.

Type specimen in the United States National Herbarium; collected May 1, 1867, on the Verde Mesa, Arizona, by Dr. Charles Smart.

* Hook. Fl. Bor. Amer., I, 1833, 249.

† Loc. cit., t. 86.

‡ Wheeler Survey, No. 796.

§ Proc. Amer. Acad. Sci., XX, 1884, 8-12.

The species undoubtedly is confined to the Lower Sonoran zone of the desert region. *S. gnaphaloides* belongs to the intramontane region of California.*

*The word "intramontane" is applied here to that portion of California west of a line of mountains made up of the Sierra Nevada, San Bernardino, and San Jacinto ranges, together with their connecting ridges. That area is thus distinguished from the ultramontane or desert and Great Basin portions of the state. The two regions are marked by distinct characteristic floras. North of the Sierra Nevada and south of the San Jacinto Mountains the precise location of the dividing line has not been clearly determined.